

## COMBINED COARSE AND FINE AGGREGATE SPECIFIC GRAVITY AND ABSORPTION

(An Arizona Method)

### SCOPE

1. (a) This procedure describes the method which is used to determine the combined coarse and fine aggregate specific gravity and absorption when the specific gravity and absorption of the fine aggregate and the coarse aggregate are known. Arizona Test Method 210 describes the procedure for determining the coarse aggregate specific gravity and absorption. Arizona Test Method 211 describes the procedure for determining the fine aggregate specific gravity and absorption.

(b) See Appendix A1 of the Materials Testing Manual for information regarding the procedure to be used for rounding numbers to the required degree of accuracy.

### CALCULATIONS

2. (a) Combined Bulk (Oven Dry), Bulk (SSD), or Apparent specific gravity is determined by the following:

$$\text{Combined Specific Gravity} = \frac{100}{\frac{P_c}{G_c} + \frac{P_f}{G_f}}$$

Where:  $P_c$  = Percent of Coarse Aggregate  
 $P_f$  = Percent of Fine Aggregate  
 $P_c + P_f = 100$   
 $G_c$  = Specific Gravity of Coarse Aggregate  
 $G_f$  = Specific Gravity of Fine Aggregate

Example, for Combined Bulk (SSD) Specific Gravity, where:

$P_c = 41$

$P_f = 59$

Coarse Aggregate Bulk (SSD) Specific Gravity = 2.597

Fine Aggregate Bulk (SSD) Specific Gravity = 2.626

$$\text{Combined Bulk (SSD) Specific Gravity} = \frac{100}{\frac{41}{2.597} + \frac{59}{2.626}} = 2.614$$

(b) Combined absorption is determined by the following:

$$\text{Combined Absorption} = \frac{\left[ \begin{array}{c} \text{Combined Bulk} \\ \text{(SSD) Specific} \\ \text{Gravity} \end{array} \right] - \left[ \begin{array}{c} \text{Combined Bulk} \\ \text{(Oven Dry) Specific} \\ \text{Gravity} \end{array} \right]}{\left[ \begin{array}{c} \text{Combined Bulk} \\ \text{(Oven Dry) Specific} \\ \text{Gravity} \end{array} \right]} \times 100$$

Example: Combined Bulk (SSD) Specific Gravity = 2.614  
 Combined Bulk (Oven Dry) Specific Gravity = 2.576

$$\text{Combined Absorption} = \frac{(2.614) - (2.576)}{(2.576)} \times 100 = 1.48\%$$

## REPORT

3. (a) Report combined Bulk (Oven Dry), Bulk (SSD), or Apparent specific gravity to the nearest 0.001, and indicate the type of specific gravity, whether Bulk (Oven Dry), Bulk (SSD), or Apparent.

(b) Report combined absorption to the nearest 0.01%.